

Claims

1. A fuel cell power plant, comprising:
  - a plurality of fuel cells, each of said fuel cells having at least one fuel flow field, each fuel flow field having a fuel inlet and a fuel outlet;
  - 5 a fuel supply pipe;
  - a fuel inlet manifold in fluid communication with all of said fuel flow field inlets;
  - a fuel inlet chamber interconnected with said fuel supply pipe and including a permeable baffle through which fuel from said
  - 10 chamber is flowed into said fuel inlet manifold;
  - an exhaust valve in fluid communication with said fuel inlet chamber, said exhaust valve being located at a distance from the interconnection of said fuel inlet chamber with said fuel supply pipe;
  - a controller for causing said valve to be open during startup
  - 15 of the flow of fuel from said fuel supply pipe into said fuel inlet chamber, whereby to purge fuel inlet gas that is within said fuel inlet chamber prior to the flow of hydrogen; and
  - a fuel recycle system for providing recycle fuel from said fuel outlets into said fuel inlet manifold downstream of said permeable
  - 20 baffle.
2. A fuel cell power plant, comprising:
  - a plurality of fuel cells, each of said fuel cells having at least one fuel flow field, each fuel flow field having a fuel inlet;
  - a fuel supply pipe;
  - 5 a fuel inlet manifold in fluid communication with all of said fuel flow field inlets; and

10 an inlet fuel distributor having a fuel inlet chamber interconnected with said fuel supply pipe and including a permeable baffle through which fuel from said chamber is flowed into said fuel inlet manifold.

3. A fuel cell power plant according to claim 2 wherein said permeable baffle is made of porous material.

4. A fuel cell power plant according to claim 2 wherein said permeable baffle is solid and has a plurality of small orifices therethrough.

5. A fuel cell power plant according to claim 2 wherein said permeable baffle is a tube.

6. A fuel cell power plant according to claim 2 wherein said permeable baffle comprises screening.

7. A fuel cell power plant according to claim 2 wherein said permeable baffle comprises mesh.

8. A fuel cell power plant according to claim 2 wherein: said permeable baffle comprises honeycomb.

9. A fuel cell power plant according to claim 2 wherein: said fuel inlet manifold includes a surface which is substantially normal to the flow of fuel through said permeable baffle, and fuel flowing through said permeable baffle impinges on said

5 surface thereby changing the direction of flow of said fuel and causing said flow of fuel to become substantially uniform.

10. A fuel cell power plant according to claim 2 wherein:  
portions of said permeable baffle which are closer to said fuel supply pipe are farther away from said fuel inlet manifold than portions of said permeable baffle which are at a distance from said fuel supply pipe.

11. A fuel cell power plant according to claim 2 wherein:  
said inlet fuel distributor comprises a fuel inlet chamber including said permeable baffle, fuel is received in one end of said fuel inlet chamber, and said fuel inlet chamber is tapered, becoming smaller at greater distances from said one end.

12. A fuel cell power plant according to claim 2 wherein:  
said fuel inlet distributor comprises a first internal fuel manifold receiving fuel from said fuel supply pipe, a second internal fuel manifold providing fuel to said fuel inlets and receiving fuel through said permeable baffle from said first internal fuel manifold.

13. A fuel cell power plant, comprising:  
a plurality of fuel cells, each of said fuel cells having at least one fuel flow field, each fuel flow field having a fuel inlet;  
a fuel supply pipe;  
a fuel inlet manifold in fluid communication with all of said fuel flow field inlets;  
an inlet fuel distributor;

a inlet fuel inlet chamber interconnected with said fuel supply pipe and in fluid communication with said fuel inlet manifold;

10            an exhaust valve in fluid communication with said fuel inlet chamber, said exhaust valve being located at a distance from the interconnection of said fuel inlet chamber with said fuel supply pipe; and

15            a controller for causing said valve to be open during startup of the flow of fuel from said fuel supply pipe into said fuel inlet chamber, whereby to purge fuel inlet gas that is within said fuel inlet chamber prior to the flow of hydrogen.

14.    A fuel cell power plant, comprising:

a plurality of fuel cells, each of said fuel cells having at least one fuel flow field, each fuel flow field having a fuel inlet and a fuel outlet;

5            a fuel supply pipe;

a fuel inlet manifold in fluid communication with all of said fuel flow field inlets;

10            a fuel inlet chamber interconnected with said fuel supply pipe and including a permeable baffle through which fuel from said chamber is flowed into said fuel inlet manifold; and

a fuel recycle system for providing recycle fuel from said fuel outlets into said fuel inlet manifold downstream of said permeable baffle.